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## SEVEN NEW NEOTROPICAL SCARAB BEETLES-1938

BY LAWRENCE W. SAYLOR,

*Bureau of Biological Survey, U. S. Department of Agriculture.*

The seven species of scarab beetles described herein are all members of the large genus *Phyllophaga*. For the opportunity of studying the present material the author is indebted to Dr. E. A. Chapin, of the U. S. National Museum; Dr. P. J. Darlington, of Harvard University; H. E. Hinton, of Cambridge, England; and Ferd. Nevermann, of Costa Rica.

***Phyllophaga (Listrochelus) venodiola*, new species.**

*Male*.—Robust to elongate-oval, rufocastaneous above, legs, head, and thorax strongly shining, entirely glabrous above except for elytra, which are densely pruinose. Front shallowly, finely and (usually) not densely punctured; vertex without noticeable carina; clypeal suture strongly biarcuate, not impressed; clypeus (usually) much more densely punctured than front, apex subtruncate and but little reflexed, the angles rounded. Antennae 10-segmented, reddish, club testaceous and subequal to funicle. Thorax with lateral margins roundly dilated, sparsely but coarsely crenulate and ciliate, angles obtuse but well indicated; base and apex with well-defined marginal lines; disc very finely and moderately densely punctate, the punctures separated by two to three times their diameters; more closely punctate along apical margin and sides. Elytra densely and finely punctured, with one weak stria indicated besides the sutural, each puncture with a minute, scarcely obvious hair. Pygidium strongly convex at middle, finely, moderately-coarsely and densely punctured in basal two-thirds, the punctures separated by two to three times their diameters and each with a minute hair; basal area pruinose, apical third highly polished. Abdomen flattened, pruinose, finely punctured; 6th sternite longer than 5th and more obviously transversely flattened, disc scabrose and with moderately dense, short, and fine erect hairs; apical margin ciliate. All claws finely pectinate along a *double* margin, without larger intermixed teeth. Hind tibial spurs slender, unequal, one being considerably longer than the basal tarsal segment. Front tarsal segments 1 to 3, inclusive, each with a brush of short yellowish hairs at inner apex.

*Female*.—Antennal club shorter than funicle; puncturing of vertex denser than in male; elytral striae more obvious; pygidium flattened, with a slight convex area just before apex, this small gibbosity highly polished, the remainder of pygidium pruinose, and sparsely punctured, with fine short, subprocumbent hair; abdomen highly polished at middle, 6th sternite shorter and more densely punctured than 5th. All claws with a strong sharp tooth a little beyond the middle and the lower margins basad of this tooth finely crenulate; claws serrate along a *double* margin (high power). Otherwise similar to male.

Length, 16–17 mm. Width, 7–8 mm.

The type series, of 13 males and 2 females, from Venodio, Sinaloa, Mexico, was collected June 12, 1915, by A. Kusche, and given to the United States National Museum by B. P. Clark. The *holotype* male and *allotype* female and *paratypes* are in the National Museum, and paratypes in the collection of the writer.

This interesting species, which has asymmetrical male genitalia, is nearest to *P. testaceipennis* Moser, but differs especially in color, male abdominal structure, and the position of the tarsal claw tooth in the female.

#### **Phyllophaga (*Listrochelus*) *mimicana*, new species.**

*Male*.—Elongate, subparallel, rufocastaneous above, thorax more rufous, apparently glabrous dorsally. Head, including clypeal disc, exceedingly coarsely, confluent, and rugosely punctured; clypeal apex moderately reflexed, slightly but widely emarginate medially, angles rounded. Antennae 10-segmented, club a little shorter than funicle. Thorax polished, with lateral margins roundly dilated and scarcely or not at all crenulate, nor ciliate, the margins nearly straight before and behind the lateral dilations, base and apex strongly margined; disc finely and sparsely punctured; punctures much closer together and coarser along the front margin; front and hind angles obtuse but evident. Elytra with striae, except sutural, weakly developed, moderately-coarsely, and sparsely punctured. Scutellum impunctate and smooth, except for that part normally hidden by the pronotum. Pygidium polished, semi-convex, with very sparse and fine punctures, and short, inconspicuous hair. Abdomen highly polished, with a mere suggestion of a longitudinal sulcation; 5th and 6th sternites plane, shining, sparsely punctured, 6th a little longer than the 5th, its apical fourth more densely punctured. All tarsal claws very finely pectinate or serrate along a *single* margin, without larger teeth intermixed. Upper tooth of front tibia nearly obsolete. Hind spurs free, unequal. Length, 11 mm. Width, 4 mm.

*Holotype* and *paratype*, both males, are in the author's collection, and were collected by Howard Gentry at San Bernardo, Rio Mayo, Sonora, Mexico, in July, 1935.

Closely related to *P. timidus* (Horn) from Arizona, but has much larger and quite different genitalia, the thorax and pygidium less densely punctured, the size a little larger, and the pectination of the tarsal claws much more obvious.

**Phyllophaga (*Listrochelus*) *obliquestriata*, new species.**

*Male*.—Robust oval, shining, rufocastaneous, nude above except for a very few minute hairs at base of elytra and the erect frontal hairs. Head with front coarsely and rugosely punctate, with an obvious transverse carina on vertex; clypeus long, its apex greatly reflexed, subtruncate, the angles broadly rounded; disc flat, moderately densely, shallowly, but not coarsely, punctured. Antennae 10-segmented, rufous, club testaceous, about one-sixth longer than funicle. Thorax semicrenulate at sides, front angles semi-rounded, hind angles very obtuse, disc very densely but not coarsely punctate, the punctures closer together each side of median line and near center of front margin. Elytra finely but not densely punctured; first or sutural stria large, abbreviated near base; 2nd stria oblique and almost 3 times wider at apex (where it fades out just before the declivous elytral apex) than at base; 3rd stria scarcely indicated. Pygidium very convex, shining, nude, very sparsely and finely punctured, apex widely subtruncate. Abdomen with 2nd segment at middle, and all of the segments at the sides, pruinose; middle polished, widely, but shallowly canaliculate, and very sparsely, setigerous-punctate; 5th sternite similar to 4th, but a little longer; 6th two-thirds the length of the 5th, slightly flattened, somewhat rugose, finely and sparsely punctured, the apex a little thickened and very slightly raised. Hind spurs free, one three-fourths as long as the other. All claws pectinate on a *single* margin, the pectinations of more or less similar size throughout. Length 15 mm.

*Holotype* in the author's collection, from "Mexico." This species seems nearest to *P. culminata* Bates, which is known from the female only; however, *P. obliquestriata* lacks a semicircular clypeus and a frontal tubercle as described for that species and has a strong transverse carina on the vertex not mentioned in the description of *P. culminata*.

**Phyllophaga (*Listrochelus*) *foralita*, new species.**

*Male*.—Robust oval, rufotestaceous, thorax and head strongly rufous, shining, elytra densely pruinose and sparsely hirsute, otherwise glabrous above. Front flattened, coarsely and densely punctured, vertex with a prominent, obtuse transverse, carina; clypeus long, moderately coarsely and densely punctate, apex subtruncate, the angles broadly rounded, margin markedly reflexed. Antennae 10-segmented, rufotestaceous, club testaceous, slightly longer than funicle. Thorax crenulate at sides, especially on posterior half, ciliate, hind angles obtusely subangulate, front angles rounded, front margin strongly thickened; disc very finely, sparsely and rather regularly punctured, the punctures separated by distances equal to 1 to 3 times their diameters, averaging a little closer near sides. Elytra finely and sparingly punctured, with very sparse, moderately long, erect hair scattered over the surface. Pygidium convex, shining, finely and sparsely punctured, with moderately long suberect hairs, apex subtruncate and ciliate. Abdomen polished at middle, pruinose at sides, disc shallowly and widely concave from sternites 2 to 5 inclusive, the 5th a little more densely punctured, center of apex narrowly and angularly, but not deeply



incised, the 6th sternite much shorter, strongly setigerously punctured. Claws *bipectinate*, front and hind claws with a somewhat larger tooth near center of outer pectinate margin, middle claws much less obviously toothed. Length, 16 mm.

The *holotype* male from Saltillo, Coahuila, Mexico, collected by H. F. Wickham in July, 1933, is in the United States National Museum; a male *paratype* from the same locality is in the author's collection.

*P. foralita* is not closely related to any of the Mexican species, but is a member of the *P. mucorea* group of the United States, from all species of which it differs in the form of the male genitalia.

#### **Phyllophaga (Phytalus) rugithorax**, new species.

*Male*.—Oblong-oval, shining, head and thorax nigrocastaneous, remainder yellow-brown. Front flat, with a suggestion of a concavity, coarsely densely punctured, not scabrous, the punctures contiguous at sides, separate at middle, a small area just in front of the clypeal suture impunctate; disc with moderately long, suberect hair; clypeus very long, sides subparallel, and angles narrowly rounded, front margin distinctly and evenly reflexed, making the clypeus appear deeply concave, apex slightly rounded to subtruncate, disc sparsely punctured basally, rather densely punctate apically, with sparse, short, erect hair. Antenna 9-segmented, nigrotestaceous, with the club darker, segments 3 and 4 slightly longer than 2, club equal to, or very slightly longer than the entire stem. Thorax laterally very convex near middle, margin finely crenulate, with long cilia, front angles subrectangular, hind angles obtusely angular, front margin ciliate and thickened, base traversed by a single row of closely set punctures; disc slightly wrinkled medially, sparsely punctured, the punctures small and separated by distances equal 1 to 3 times their diameters, much sparser near middle of front margin and in areas laterad of disc, glabrous except for half a dozen short erect hairs just behind middle of front margin. Elytra glabrous, striae subobsolete, finely and regularly punctured near sides, smooth in middle. Pygidium convex, shining, sparsely punctate, the punctures fine and separated by one to one and one-half times their diameters, sparser at apex, denser at base; with very short, scattered erect hair; apex subangularly rounded. Scutellum very finely punctured near sides, smooth in middle. Abdomen shining, sparsely and finely, setigerous-punctate; 5th sternite with a few punctures at middle and with short semi-erect hair; 6th one-half as long as 5th, sparsely setigerous-punctate, the hairs short; surface slightly convex and seemingly not at all impressed, either longitudinally or transversely. Hind spurs free. Claws narrowly cleft, upper claw tooth shorter and broader and much less acute than apical tooth, base obtusely angulate-dilated. Front tibia distinctly tridentate. First two segments of hind tarsus subequal. Length, 10 mm.

*Type and paratype*, both males, labelled "L. Cruzes, Mexico, June 13, 1934," collected and presented to the author by H. E. Hinton, are in the writer's collection.

*P. rugithorax* is a member of the difficult *P. aegrota* group and is close to

*P. omiltemia* and *aegrota* var. of Bates; it differs from *P. omiltemia* in the unicolorous thorax, and in the differently shaped clypeus; from *aegrota* var. the present species may be distinguished by the much less densely punctured pygidium, shorter antennal club, and differently shaped clypeus (clypeus in *aegrota* var. reflexed mostly at the middle). This new species also seems close to *P. hirtifrons* Moser, but differs in many details: the color of head and thorax is piceocastaneous and not at all red; the front is not scabrous; the clypeus is not short and its anterior margin is not sinuate but rounded or subtruncate; antennal segments 3 and 4 are only slightly elongate, the thorax is rugose; the pygidium is only moderately densely punctate; and the last abdominal segment is not impressed.

**Phyllophaga (Phyllophaga) bowditchi**, new species.

*Male*.—Oblong oval, somewhat wider behind, rufotestaceous, thorax rufous and usually shining, elytra pruinose and opaque, with very fine hairs or glabrous. Front rugosely and coarsely punctured, with erect, short hair; clypeus very transverse, coarsely punctured, broadly, almost semi-circularly rounded apex, subtruncate at middle, margin but slightly reflexed. Antennae 10-segmented, unicolorous, rufotestaceous, segments 2-7 short, club longer than funicle, not quite as long as the entire stem. Thorax slightly crenulate behind dilation, margin ciliate; disc very irregularly, sparsely punctured at center, the umbilicate punctures moderately coarse and separated by a distance equal to from 2 to 4 times their diameters, much denser at sides and near front margin, either glabrous or with very minute hairs. Elytra densely but not coarsely punctured, glabrous or with minute hair as in the thorax. Pygidium strongly rugose and densely, coarsely punctate at base, somewhat smooth at apex, disc with minute hair, apex with long cilia. Abdomen strongly shining, shallowly and widely sulcate at middle and sparsely, setigerous-punctate; 5th sternite coarsely, but sparsely punctured at sides, middle with a densely and finely granulated patch and with long erect hairs, 6th sternite not quite so long as 5th, very coarsely punctured, with long erect hair, and a suggestion of a longitudinal sulcus in some specimens. Hind spurs free. Claws strongly cleft, almost as in *Phytalus*, the upper tooth a little broader than, but of the same length as, the apical tooth, *finely* denticulate on lower edge, base of claw scarcely dilated.

*Female*.—Antennal club equal to funicle; abdomen convex, polished, 5th and 6th sternites densely setigerous-punctate; claws more widely cleft; otherwise as in male.

Length, 12.5 to 16 mm.

*Type* and *paratypes* are in the Museum of Comparative Zoology at Harvard, and are all from "M-tee Dist." British Honduras, March 1906, collected by F. C. Bowditch. *Paratypes* in the author's collection.

An interesting species related to *P. testaceipennis* and *P. heynei*; from the latter it may be separated by the shorter antennal club and the much sparser thoracic hair. It has the same type of genitalia as *P. testaceipennis*, differing only in detail, while the tarsal claws are of the same odd type found in that species; the present species, however, is much smaller, the

thorax is more densely and coarsely punctured, and the 5th sternite in the male is straight and *not* deeply emarginate at center of apex.

**Phyllophaga (Phyllophaga) elenans**, new species.

*Male*.—Elongate oval, castaneous, head and thorax rufous, shining, with a faint pruinose elytral sheen, pilose above. Front and clypeus coarsely, variolately, and rather regularly, but not densely punctured, front with a few erect hairs; clypeal apex narrowly but not deeply emarginate at center, angles very broadly rounded, margin but slightly reflexed. Antenna 10-segmented, club shorter than funicle, but slightly longer than segments 3-7 combined, segments 6 and 7 slightly dentate on the inner side. Thorax with sides subarcuate, front angles subrectangular, hind angles obtusely angulate, disc with a small longitudinal impunctate area at center, moderately densely, subcoarsely, variolately-punctate, the punctures separated by 2-4 times their diameters, somewhat closer together at sides, each puncture with a short but fairly prominent, suberect hair. Elytra punctured like thorax, with short erect hairs and several much longer hairs along and near the elytral suture on the basal three-fourths. Pygidium convex, punctation like that of thorax but slightly more dense, with short erect hairs, apex ciliate. Abdomen subconvex, polished; 5th sternite with scattered transverse granules at center, subdeclivous in apical fourth at middle of apex; 6th one-third the length of the 5th, transversely carinate at base and apex, sparsely punctured. Hind tibia with one spur fixed, long and narrow (about three-fourths as long as the other), not unciform. Claws with a strong median tooth, which is as long as the apical tooth, base obtusely and not conspicuously dilated. Length, 17 mm.

The unique male *type*, loaned for study by Ferd. Nevermann and in his collection, is from Santa Elena, Guanacaste, Costa Rica, Tassman Collector, June 1924.

This species belongs to the difficult *P. rorulenta* complex, but may be separated by the following combination of characters: hairy upper surface, long and not unciform fixed tibial spur, and shining surface; it is otherwise closely related to *P. rorulenta* and allies in all characters, including the genitalia, the latter, however, being specifically distinct.